

02 May, 2001

MODIS sensor Working Group (MsWG) Summary

Attendance: Bill Barnes, Sue Walsh, Chris Moeller, Ed Zalewski, Eddie Kearns, Eric Vermote, Gary Toller, Jack Xiong, Jim Young, Mike Roberto, Roger Drake, Steve Platnick, Vince Salomonson, Wayne Esaias, Zhengming Wan, Gwyn Fireman

Erratum for April 25: In the item titled "**Band 34 temperature end-of-scan rise**", 3rd paragraph: the bias is in Band 34, not Band 36 as stated.

Scheduled Items

News:

- The LWIR PV sweep may not have been carried out correctly; it appears that the DCR was not turned off. [Action 0104-29: Continue analysis of LWIR PV sweep data.](#)
- MCST verified that the Band 5 gain change took effect as planned.

One Year Data Reprocessing Issues

As of last week, one of the preferred options was to use m1 values predicted from a quadratic fit for retrospective processing, and projected linearly for forward processing. Jack Xiong met with Vince Salomonson, Bill Barnes, Bob Murphy and Wayne Esaias to discuss the m1 LUT to be used for consistent one-year reprocessing. The new approach is that the fit be continuous for both retrospective and forward processing.

Charts showing band-averaged m1 trends were discussed. For each band, the reflectance coefficient was normalized to day 84 and adjusted for any applied gain change. Also shown were linear and quadratic fits to m1 for each band.

- SWIR bands (5,6,7,26) show little change with time, and deviations from the linear fit are small.
- Bands calibrated using the unscreened Solar Diffuser (1,2,3,4,17,18,19) were shown on one plot.
- Bands which saturate on the unscreened Solar Diffuser (8,9,10,11,12,13,13h,14,14h,15,16) were calibrated using the screened SD; these bands are shown together on one plot. Normalized values and fits for Bands 13h and 14h are coincident with their low-gain counterparts.
- For most bands, the quadratic fit closely follows the linear fit within the range of measured m1 values, but diverges significantly for extrapolated values – over 2% in two years for Bands 2 and 8.

- High residuals might be due to an incompletely characterized BRF. On-orbit BRF is validated during a yaw maneuver, using the SD screen. Results were found to be within 0.5% of pre-launch values, so for those bands the prelaunch BRF is used on-orbit.
- Some bands show m1 decreasing with time, seeming to indicate the detectors are increasing sensitivity – a non-physical situation from a degradation point of view. Electronic gain may be changing slowly; a rapid change was seen when switching from side A to B.

Decision: We will use m1 values predicted from a linear fit for consistent one-year reprocessing.

- Changing the fit type will not have an impact on Miami's schedule as long as they get the new LUT soon.
- Each detector, subframe and mirror side follows the band-averaged m1 fit trends; no outliers are expected.
- Miami uses a constant ratio to derive MS2 correction values.

[Action 0104-30: Send to Miami table of m1 values predicted from linear fit to historical values.](#)

- m1 values will be predicted through November 2001, for side B only.
- Linear interpolation is applied by L1B software, but about 8 LUTs are needed to accommodate applied gain and VDET/ITWK changes.

Around the Table

Moeller:

Sent charts to MCST showing mirror-side correlated noise and striping in LWIR PC Bands 33 – 36. Imagery shows that striping in Bands 33 and 34 is different from Bands 35 and 36; a random factor is superimposed on MS difference in Band 34. Striping has been the same since March 2000 and so is not correlated with the switch to electronics side B.

Xiong indicated that after cooler outgassing (about day 230), Band 34 NEdT increased significantly. Drake confirmed. Moeller will send the same charts to SBRS.

Barnes:

We are trying for another maneuver, and will meet with Salomonson and Jon Ranson, the Terra Project Scientist.

Drake:

Working on the FM-1 system-level SDSM test. The current source radiometry has an apparent incident angle of 0; in the new test the source will be positioned to get response

from various sun angles to identify any PFM-like variations. They are also continuing with measurements in the lab.

Spaceview door latches have been replaced; the SV door is failsafe qualified, but will not be installed until the S/C is in proper orientation. TRW indicates that thermal vacuum will begin in July.

Kearns:

Working on detector-to-detector differences and mirror side changes to derive absolute calibration. Howard's polarization correction is in the latest code release, received May 1.

Esaias:

There will be an IR round robin at the end of May, to include NIST sources.

Wan:

Received the DN trending plots.

Platnick:

Q: Is there still a SWIR band second sample issue?

A: Each subframe has a different crosstalk correction coefficient. Any absolute differences in SD measurements go into the calibration term. Bands 5 and 7 show from 2 to 7% striping; MCST will continue to pursue the question. January imagery shows the second-sample effect. SRCA test data has been received, but analysis has been slightly delayed since a staff member is on disability leave.

If a fix for the SWIR band second sample issue becomes available during the one-year consistent reprocessing, we should consider whether to implement it.

Vermote:

Q: Are there any specifications for detector-to-detector differences in the calibrated product?

A: MODIS specifications indicate that detector-to-detector differences should be "negligible", without definition. We could identify expected det/det variation from the calibrated Solar Diffuser view.

Action 0104-31: Process at least two Solar Diffuser views with L1B, and analyze for detector-to-detector differences in the calibrated product.

compiled by G. Fireman 4 May, 2001